

CLAIMS

What is claimed is:

- 5 1. An antibody which specifically binds to an epitope defined by at least a ten amino acid sequence from human DNA-PKcs, said sequence comprising:
a phosphorylated threonine at position T2609, wherein:
said antibody does not bind when T2609 is not phosphorylated.
- 10 2. The antibody of claim 1, wherein:
said antibody is a monoclonal antibody.
3. The antibody of claim 2, wherein:
said monoclonal antibody is a human monoclonal antibody
- 15 4. The antibody of claim 1, wherein:
said antibody is pT2609mAb.
5. An antibody which specifically binds to an epitope defined by at least a ten amino acid sequence from human DNA-PKcs, said sequence comprising:
20 a phosphorylated serine at position S2056, wherein:
said antibody does not bind when S2056 is not phosphorylated.
6. The antibody of claim 5, wherein:
25 said antibody is a monoclonal antibody.
7. The antibody of claim 6, wherein:
said monoclonal antibody is a human monoclonal antibody.
- 30 8. The antibody of claim 5, wherein:
said antibody is pS2056mAb.

9. A method for determining the ability of a test compound to block phosphorylation of human DNA-PKcs, comprising:
providing a sample containing a DNA-PKcs peptide fragment capable of being phosphorylated,
5 combining said test compound with said sample,
inducing phosphorylation of the DNA-PKcs peptide fragment, and
measuring the resulting phosphorylation of said DNA-PKcs peptide fragment at T2609 and/or S2056 in the presence of the test compound.

10 10. The method of claim 9, wherein:
said measuring step is carried out by measuring the binding of an antibody which specifically binds to an epitope comprising either or both of (a) a phosphorylated serine at position S2056 in human DNA-PKcs or (b) a phosphorylated threonine at position T2609 in human DNA-PKcs.

15 11. The method of either of claims 9 or 10, wherein:
said DNA-PKcs peptide fragment is an isolated peptide having less than 1000 amino acids, and comprising: SEQ ID NO: 4, SEQ ID NO: 5, or sequences having at least 90% homology thereto.

20 12. The method of either of claims 9 or 10, wherein:
said DNA-PKcs peptide fragment is selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13 and SEQ
25 ID NO: 14.

13. The method of either of claims 9 or 10, wherein:
said test compound is selected from the group consisting of: wortmannin, substituted or unsubstituted imidazoles, substituted or unsubstituted pyrazoles, substituted or
30 unsubstituted fluoranthenes, substituted or unsubstituted thiazoles, substituted or unsubstituted quinolinones, substituted or unsubstituted phthalazinones, and derivatives thereof.

14. An isolated peptide having less than 1000 amino acids, comprising:
SEQ ID NO: 4, SEQ ID NO: 5, or sequences having at least 90% homology thereto.
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15. The isolated peptide of claim 14, wherein:
T2609 and/or S2056 are replaced by an amino acid selected from the group consisting
of: Valine, Alanine, Glycine, and Leucine.
- 10 16. An isolated polynucleotide encoding the peptide of either claims 14 or 15.
17. The isolated polynucleotide of claim 16, having a sequence selected from the group
consisting of: SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 19,
SEQ ID NO: 20, SEQ ID NO: 21, SEQ ID NO: 22, SEQ ID NO: 23, SEQ ID NO:
15 24, SEQ ID NO: 25, and SEQ ID NO: 26.
18. A method of measuring radiosensitivity of cells in a subject, comprising:
(a) providing a cell sample from said subject, said sample containing subject's DNA-
PKcs,
20 (b) combining said sample with a labelled antibody which binds to phosphorylated
residue T2609 or phosphorylated residue S2056 but not the unphosphorylated
residues,
(c) removing any unbound antibody from the sample, and
(d) measuring the degree of phosphorylation of the DNA-PKcs by determining the
25 extent of binding of the antibody to the DNA-PKcs,
whereby the degree of antibody binding to DNA-PKcs correlates to the degree of
phosphorylation, a higher degree of phosphorylation indicating less radiation
sensitivity.
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